

What is claimed is:

- Sub A9
1. A metal conductor having a cured coating of about 2.5 μm to about 500 μm thickness which coating has a dielectric dissipation factor (60Hz, 24°C) of lower than about 0.05 and is a radiation-cured coating formulated from a coating composition comprising:
 - a) an acrylate functional urethane oligomer having a hydrocarbon backbone;
 - b) at least one mono- or polyfunctional diluent; and optionally
 - c) a photoinitiator.
 2. A metal conductor according to claim 1, wherein the metal is iron, copper, aluminum or silver.
 - A9 3. A metal conductor according to claim 2, wherein the metal is aluminum, copper or silver.
 - ins A10 4. ~~A metal conductor~~ according to claim 1, wherein the cured coating has an elongation at 25°C of greater than about 50% as a 25 μm thin cured coating.
 - ins A10 5. ~~A metal conductor~~ according to claim 4, wherein the cured coating has at least one T_g of below 20°C as measured by the peak of the $\tan \delta$ curve in a

DMA analysis at 1 Hz.

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6. ~~A metal conductor~~ according to claim 1, wherein the cured coating has a dissipation factor at 60 Hz at 150°C of lower than about 0.2.

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7. ~~A metal conductor~~ according to claim 1, wherein the cured coating is formulated from the coating composition which further comprises an adhesion promotor.

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8. ~~A metal conductor~~ according to claim 1, wherein the cured coating is a radiation-cured coating formulated from components comprising:

- a) about 20 wt.% to about 80 wt.% of an acrylate functional urethane oligomer having a hydrocarbon backbone;
- b) about 20 wt.% to about 80% of one or more mono- or polyacrylate functional monomers and optionally;
- c) about 1 wt.% to about 10 wt.% of one or more light sensitive radical generating compounds; and optionally
- d) about 0.2-5 wt.% of an adhesion promotor.

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9. ~~A metal conductor~~ according to claim 1, wherein the cured coating is a coating cured by irradiation with light with a wavelength between about 200 μm to about 700 μm , and in the

photoinitiator is present in about 1 wt.% to about 10 wt.% of the coating composition.

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10. ~~A metal conductor~~ according to claim 1, wherein the cured coating is a coating which is formulated from components comprising:

- a) about 30 wt.% to about 65 wt.% of an acrylate functional urethane oligomer having a hydrocarbon backbone;
- b) about 20 wt.% to about 70 wt.% of at least two acrylate functional diluents, one of said acrylate functional diluents being a monoacrylate and one of said acrylate functional diluents being a polyacrylate functional compound;
- c) about 1 wt.% to about 10 wt.% of one or more light sensitive radical generating compounds; and
- d) about 0.2 wt.% to about 5 wt.% of an acid functional adhesion promotor.

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11. ~~A metal conductor~~ according to claim 6, wherein the adhesion promotor is an acid functional compound.

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12. ~~A metal conductor~~ to claim 1, wherein the cured coating further comprises about 0.2 wt.% to about 5 wt.% of a pigment or a dye.

ins A10 13. ~~A metal conductor~~ according to claim 1, wherein
the cured coating has a thickness of about 10 μm
to about 100 μm .

ins A10 14. ~~A metal conductor~~ according to claim 1, wherein
the cured coating has a dielectric constant lower
than about 5.

ins A10 15. ~~A metal conductor~~ according to claim 1, wherein
the cured coating has a dielectric dissipation
factor lower than about 0.05 (60Hz, 24°C) after hot
oil exposure (150°C).

Sub A11 16. A metal conductor according to claim 1, wherein
the coating is formulated from components
consisting essentially of:

- a) about 30 wt.% to about 65 wt.% of an acrylate
functional urethane oligomer having a
hydrocarbon backbone;
- b1) about 10 wt.% to about 50 wt.% of a mono-
acrylate functional diluent;
- b2) about 5 wt.% to about 40 wt.% of a poly-
acrylate functional diluent;
- c) about 2 wt.% to about 7 wt.% of at least one
photoinitiator;
- d) about 0.2 wt.% to about 4 wt.% of adhesion
promotor; and

e) about 0.2 wt.% to about 2 wt.% of a pigment.

17. ~~A metal conductor according to claim 1, wherein
said hydrocarbon backbone is fully saturated.~~

18. A radiation-curable coating composition
comprising:

- a) an acrylate functional urethane oligomer
having a hydrocarbon backbone;
- b) one or more mono- or polyfunctional diluents;
and optionally
- c) one or more light sensitive radical
generating compounds;

which coating when cured with radiation has a
dielectric dissipation factor at 60 Hz at 24°C of
lower than about 0.05, a dissipation factor at 60
Hz at 150°C of lower than about 0.2, and an
elongation at 25°C of a 25 μ m thin cured coating of
at least about 50%.

19. A radiation-curable coating composition according
to claim 18, wherein said hydrocarbon backbone is
fully saturated.

20. A radiation-curable coating according to claim 16,
wherein the urethane oligomer is the reaction
product of a hydrocarbon polyol, a polyisocyanate
and an hydroxyfunctional endcapping monomer.

21. A radiation-curable coating composition according to claim 20, wherein said polyisocyanate is an aliphatic polyisocyanate.

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22. A metal conductor according to claim 8, wherein said one or more monomers is a mono- or polyfunctional alkylacrylate or methacrylate based monomer.

23. A method of making a metal conductor with a cured coating of about 2.5 μm to about 500 μm thickness, which cured coating has a dielectric dissipation factor (60Hz, 24°C) of lower than about 0.05 comprising the steps of:

a) providing a metal conductor;
b) coating said metal conductor with a radiation-curable coating composition which comprises;

i) an acrylate functional urethane oligomer having a hydrocarbon backbone;
ii) at least one mono- or polyfunctional diluent; and optionally
iii) a photoinitiator.

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